

limits of observation on the 4th. It was not accompanied by any high winds and with little precipitation.

II. This area appeared also in the Saskatchewan valley on the afternoon of the 8th, and moved in an almost direct southeasterly course to the coast of Maine, where it was central on the morning of the 10th. After this report it moved north-easterly, passing over Nova Scotia and disappeared during the night of the 10th. Its passage was marked by violent gales on the lakes and the Atlantic coast and light precipitation in the northern districts. The lowest observed barometer was 29.32 at Halifax on the 10th. The following wind velocities occurred on the 9th: Alpena, Michigan, 40, w., at 9.50 p. m.; Toledo, Ohio, 40, sw., at 3.40 p. m.; Sandusky, Ohio, 43, sw., at 3.20 p. m.; Buffalo, New York, 56, sw., at 8.05 p. m.; Rochester, New York, 48, w., at 6.45 p. m. At Boston, Massachusetts, a velocity of 39, w., occurred at 9.45 a. m. on the 10th. The observer at Portland, Maine, reports that the signal displayed in advance of this storm was not justified at that station, but rough weather was experienced by vessels outside of the harbor on the 10th.

III.—Rain began falling in the western Gulf states during the afternoon of the 11th, and at midnight there developed in the Indian Territory an atmospheric depression which increased considerably in energy on the 12th. It moved in a direction a little south of east to the Atlantic coast, and was central off North Carolina on the morning of the 13th, and during the day disappeared. Quite heavy rains in the southern states, with light rains and snow in the middle Atlantic states and the Ohio valley and Tennessee, marked its passage.

IV.—The midnight report of the 13th showed the presence of this depression to the west of Manitoba. At this report the barometer at stations in the extreme northwest was over .50 below the normal. On the morning of the 14th the storm-centre was near Duluth, and rain and snow began falling in the lake region. After this report the depression recurved, the centre passing over the northern portions of Lakes Michigan and Huron. At 7 a. m. of the 15th the centre was near Rockcliffe, Province of Ontario, and was last observed at midnight of the 15th moving in a northeasterly direction. The lowest observed barometer was 29.24 at Rockcliffe on the 15th. At Milwaukee, Wisconsin, a wind velocity of 45, nw., occurred at 10.15 p. m. on the 14th, and on the 15th the following velocities were reported: Grand Haven, Michigan, 49, nw.; Escanaba, Michigan, 39, n.; Toledo, Ohio, 36, sw., at 4.07 a. m.; Sandusky, Ohio, 47, nw., at 5 a. m.; Erie, Pennsylvania, 35, w., at 8.30 a. m.; Buffalo, New York, 56, sw., at 9.20 a. m.; Rochester, New York, 52, sw., at 10.15 a. m.; Oswego, New York, 38, sw., at 11.15 a. m.

V.—This storm approached the middle Atlantic coast from the sea on the afternoon of the 15th about the same time that number iv. was passing over the Canadian provinces. At this hour, as closely as can be estimated the centre was nearly fifty miles to the east of Cape Henlopen. High winds prevailed on the Atlantic coast with general rains in New England, the middle, and south Atlantic states. On the morning of the 16th the centre was in eastern Maine, the depression having moved northeastwardly. Still continuing its initial movement it passed beyond the limits of observation on the 16th. Severe gales were reported from all stations on the New England and New Jersey coasts. The observer at Eastport reports that the storm began at 11.45 p. m. and continued until 8 a. m. of the 16th, the maximum wind-velocity, 43 miles, se., occurring at 6.40 a. m. The schooner "Dawn" was wrecked on Swallow-tail Rocks during the night of the 15-16th.

VI.—This storm having a peculiar track, developed in northern Dakota at midnight of the 19th. It moved directly south to Texas, where it was central on the morning of the 21st. It then recurved, passing over the Gulf of Mexico and northern Florida and moved in a northeasterly direction along the Atlantic coast. The morning report of the 22d showed the centre to be off Savannah, Georgia, and on the 23d off Nova Scotia, from whence it passed beyond the stations of observation. It

was accompanied by precipitation in all districts except the lake region and by very high winds on the Gulf and Atlantic coasts. The lowest observed barometer was 29.74, at Sydney, Nova Scotia, on the 23d.

The observer at Norfolk, Virginia, reports the following: "a snow storm accompanied by high northerly winds began during the early morning of the 22d and continued for twenty-four hours. Snow fell to a depth of four inches and six tenths, which, for this season of the year, is without precedent since the establishment of the signal office. The schooner "A. M. Bailey" was driven ashore during the storm near Cape Henry and became a total loss."

VII.—This area made its appearance in Manitoba on the morning of the 23d. It was central at 7 a. m. of the 24th, over Lake Huron. Light snows began falling in the lake region with strong south to west winds. The morning report of the 25th, showed the centre to be near Father Point, and the area passed into the Gulf of Saint Lawrence during the day. It moved at first in a southeast direction, but after reaching Lake Huron it recurved and passed down the Saint Lawrence valley. Its influence was but slightly felt on the Atlantic coast.

VIII.—On the morning of the 28th heavy rains began falling in the Gulf states and the reports showed the presence of a trough of barometric depression extending from Texas to eastern Tennessee. During the afternoon an area of low barometer formed from this trough in eastern Tennessee. The depression was at first weak but increased greatly in energy as it approached the North Carolina coast where it was central on the morning of the 29th. The winds in the immediate vicinity of the storm-centre reached a velocity of from forty-five to sixty miles an hour and on the New Jersey and southern New England coasts they had a velocity of from thirty to forty miles. Snow fell in New England and rains in the middle, south Atlantic, and Gulf states.

IX.—This depression was first observed on the morning of the 29th in northern Montana. It moved in a southeasterly direction to Lake Michigan, where it was central on the morning of the 30th. From thence it took a northeasterly course and passed beyond the limits of observation during the day. Light rains and snow fell during its passage in the lake region, upper Mississippi and Missouri valleys. The storm had but little energy, and the winds on the lakes, though strong, were not dangerous.

A very violent storm visited the Nova Scotia coast on the 19th, and is described in chapter on North Atlantic Storms. This storm was very severe and affected the whole Atlantic coast as far south as Smithville, North Carolina. During its passage the wind at Mount Washington, New Hampshire, on the 21st, reached a velocity of 128 miles per hour, and the temperature fell to -47° .

NORTH ATLANTIC STORMS DURING MARCH, 1885.

[Pressure expressed in inches and in millimetres; wind-force by scale of 0-10.]

The paths of the depressions that have appeared over the north Atlantic ocean during the month are determined, approximately, from international simultaneous observations furnished by captains of ocean steamships and sailing vessels; abstracts of logs and other data collected by the Signal Service agencies at the ports of New York, Boston, and Philadelphia; reports furnished through the co-operation of the "New York Herald Weather Service," and from other miscellaneous data received at this office up to April 22d, 1885.

Of the ten depressions traced during the month, three, viz.: numbers 6, 7 and 10 were continuations of storms which entered the Atlantic from the North American continent; number 2 was a continuation of a depression which occupied mid-ocean at the close of February; numbers 1 and 4 prevailed over the region to the eastward of the thirtieth meridian, while the remaining depressions, numbers 3, 5, 8, and 9, first appeared near the American coast. The general direction of movement of the storm-centres was northeasterly; the tracks of numbers 7 and 8, however, were somewhat abnormal, those

depressions having moved from the region south of 35° N., in a northerly direction to the Gulf of Saint Lawrence, whence they passed beyond the range of observations. None of the depressions which passed into the Atlantic from the American continent appear to have reached Europe, nor have any of them exhibited much energy during their passage, the month being, in general, unusually free from dangerous storms. An exception to the above may be made in the case of the depression traced as number 8, this was unusually severe during its passage over Nova Scotia and the Gulf.

So far as can be determined from the data as yet to hand it would appear that an extensive area of low barometer occupied the ocean between $N. 40^{\circ}$ and 55° and from the European to the American coasts from the 1st to the 3d, causing variable winds and unsettled weather. On the 3d an area of high barometer formed between $W. 35^{\circ}$ and 50° , while the region of low pressures extended from the European coasts westward and southwestward to the Azores; to the westward of the sixtieth meridian the pressure remained unsteady and the weather unsettled. These conditions were maintained, with slight changes, until the 8th, when the high area apparently occupied the region north of the fiftieth parallel, and relatively low pressures prevailed to the southward of that parallel. By the 13th the high area in the north, which had apparently moved eastward and southward to the British Isles and to the latitude of the Azores, now began to spread westward over the ocean, and from that date until the 28th the area of high barometer occupied the ocean from $W. 50^{\circ}$ to the European coasts; after the 28th it moved westward to the American coasts.

The following are brief descriptions of the depressions charted:

1.—This depression was shown on the 1st between $N. 50^{\circ}$ and 55° and $W. 25^{\circ}$ and 30° , the lowest reported barometer reading being 29.53 (750.0); at the same time there was another large depression in the vicinity of $N. 45^{\circ}$, $W. 40^{\circ}$. By the 2d low area number 1 had passed northward beyond the range of observations, attended by strong w. and sw. breezes and number 2 had advanced eastward, the two depressions forming an extensive area of low pressures covering the ocean from $W. 40^{\circ}$ eastward, and from $N. 60^{\circ}$ southward to $N. 45^{\circ}$.

2. This depression appeared near $N. 40^{\circ}$ and 45° , and $W. 40^{\circ}$ and 45° on the 1st, and was probably closely connected with the disturbance charted as number 11 on the chart for February and with number 1 above described. The following are the lowest barometric readings reported on the 1st: s. s. "Moravia," O. Pezoldt, commanding, in $N. 41^{\circ} 40'$, $W. 48^{\circ} 40'$, barometer 29.22 (742.2), wind s., force 4, cloudy; s. s. "Wyoming," C. L. Rigby, commander, in $N. 44^{\circ} 3'$, $W. 43^{\circ} 59'$, barometer 29.34 (745.2), wind variable, force 3, changeable weather; s. s. "Eider," H. Hellmers, commander, in $N. 42^{\circ} 39'$, $W. 46^{\circ} 1'$, barometer 29.46 (745.7) winds westerly, force 2, weather squally. On the following day the winds over the region between $W. 30^{\circ}$ and 50° shifted to n., and blew with the force of a moderate to strong gale; those to the northward of 49° N. and east of 30° W., were e. and s., moderate in force, while the barometer ranged from 29.3 (744.2), to 29.6 (751.8), and cloudy or rainy weather prevailed. On the 3d the centre of disturbance was near the west coast of Ireland, the lowest barometer reported being 29.14 (740.1) on board the s. s. "Venetian," W. H. Trant, commanding, in $N. 51^{\circ} 23'$, $W. 12^{\circ} 58'$, wind w., moderate gale; over the English channel and Ireland moderate to strong s. and sw. gales prevailed, while, over the region west of the fifteenth meridian, the winds blew with the force of a gale from n. and ne. During the 3d the depression apparently passed across the British Isles.

3.—This depression appeared between $W. 70^{\circ}$ and the American coasts on the 1st. On that date the bark "Winifred," N. P. Dutton, master, reported, in $N. 37^{\circ} 17'$, $W. 73^{\circ} 15'$, barometer 29.85 (758.2), being a fall of more than .3 inch since February 28th; at the observation of the 1st the vessel had variable winds, reported as n., calm, and ssw., weather hazy. The

s. s. "City of Augusta," K. S. Nickerson, commander, from Savannah to New York, reported, in $N. 37^{\circ} 14'$, $W. 75^{\circ} 30'$, barometer 29.86 (758.4), being a fall of .2 inch since the observation of the preceding day; wind ssw., force 4, weather hazy. As the disturbance moved northeastward it increased in energy and the 2d its centre was to the southward of Nova Scotia.

The following vessels came within the influence of this depression during the 2d: the s. s. "Andes," R. de Echevarrieta, commander, had a strong gale from ssw. to wsw. and nw., between 7 p. m. of the 1st and 5 a. m. of the 2d, in $N. 36^{\circ} 30'$, $W. 71^{\circ} 0'$, the barometer read 29.5 (749.3), wind sw., force 7, squally weather and rain; the schooner "Maggie Abbott," D. C. McIntosh, commanding, in $N. 32^{\circ} 0'$, $W. 74^{\circ} 0'$, had barometer 29.7 (754.4), wind nw., force 9, heavy rain and heavy cross sea. At Bermuda, strong w. and sw. winds and rainy weather prevailed. The s. s. "Nessmore," J. Inch, commanding, in $N. 37^{\circ} 30'$, $W. 73^{\circ} 6'$, had barometer 29.48 (748.8), wind nw., force 5, clear; the s. s. "Westernland," Commodore W. G. Randle, commanding, in $N. 40^{\circ} 37'$, $W. 69^{\circ} 1'$, had barometer 29.51 (749.5), wind w. by n., force 4, weather overcast. Captain F. V. Schierbeck, commanding the s. s. "Geiser," reported as follows: "2d.—2.45 p. m., Greenwich time, wind s. by w., force 9, barometer 29.61 (752.0), falling; 4.26 p. m., in $N. 40^{\circ} 38'$, $W. 64^{\circ} 36'$, barometer 29.55 (750.5), wind s. by w., force 9, hove ship to; at 7.16 p. m., in $N. 40^{\circ} 47'$, $W. 64^{\circ} 24'$, wind lulled, and barometer rose to 29.57 (751.0), and the wind gradually veered to nw. by w., force 5, dark, rainy sky; after this the barometer rose slowly and the wind and weather gradually became more settled, but a very heavy sea remained."

At 4 p. m. of the 2d the s. s. "Waesland," J. Ueberweg, commanding, in $N. 41^{\circ} 16'$, $W. 62^{\circ} 10'$, had a whole gale from s. to sw. and wnw., lowest barometer 29.61 (752.8); and the s. s. "Scythia," P. Whealan, commanding, reported a southerly gale, which set in at 8 p. m. of the 2d (position at noon, $N. 42^{\circ} 1'$, $W. 56^{\circ} 5'$), and reached its height (force 9) at midnight, ending at about 6 a. m. of the 3d; at 1.30 a. m. of the 3d the wind veered to nw., accompanied by torrents of rain, and at 4 a. m. the lowest barometric reading, 29.57 (751.1), was observed. By the 3d the disturbance was to the southward of Newfoundland, with the pressure varying from 29.45 (748.0) to 29.6 (751.8), and strong nw. gales in its rear, near and to the westward of the fifty-eighth meridian. An area of high pressure occupied the region between $W. 35^{\circ}$ and 50° , apparently barring the advance of the depression, which probably filled in during the day.

4.—During the 3d, 4th, and 5th the barometer remained low over the ocean south of 50° N. and between the European coasts and the Azores; on the last-mentioned date a storm-centre was apparently near the northwestern coast of Spain, where the barometer read 29.41 (747.0). During the day the depression passed northeastward over the Bay of Biscay and entered northern France.

5.—This depression appeared off the United States coast south of 40° N. on the 8th, the reports on that date showing a decrease of pressure amounting to about .2 inch. At the same time there was a depression (5a) in the neighborhood of Bermuda, as shown by the report of the s. s. "Orinoco," in port there; Captain Garvin, commanding the above steamship, reported lowest barometer 29.65 (753.1) at 6 p. m. of the 9th. "This storm began about 8 a. m. of the 8th and continued as a fresh to strong gale with heavy gusts until the evening of the 9th when it shifted to wnw. in a heavy storm of wind, thunder, lightning and rain, ceasing at midnight; the barometer continued steady at about 29.75 (755.6) when it began to rise." As number 5 moved northeastward it was attended by moderate to strong gales of short duration from e. to ne. and nw. the barometer falling to 29.4 (746.7); on the 9th the storm centre was apparently to the eastward of Nova Scotia, causing moderate w. gales between $W. 50^{\circ}$ and 60° . On the 10th the region of low pressures was shown near $N. 47^{\circ}$ and between $W. 40^{\circ}$ and 45° , where the barometer ranged from 29.55 (750.6)

to 29.65 (753.1) with moderate gales from s. to nw; on the 11th the disturbance disappeared with rising barometer.

From the 6th to the 8th the reports indicate the presence of an area of low barometer over the ocean between W. 50° and 60° and N. 40° and the coast of Newfoundland; during those dates the barometer fluctuated between 29.5 (749.3) and 29.8 (756.9), and unsettled, squally weather prevailed.

6.—This was a continuation of the depression which passed over the North American continent and described as low area ii. under "Areas of low barometer." During the 10th it passed over Nova Scotia, and on the 11th its centre was near the southeastern point of Newfoundland, whence it moved east-northeastward and apparently filled in during the 12th. Its passage was attended by moderate w. and sw. gales, shifting to strong nw. winds on the 12th.

7.—This was a continuation of the depression described as low area iii. under "Areas of low barometer." It passed off the North Carolina coast on the 13th and moved northeastward, causing strong ne. to nw. gales during its passage. Captain Garvin, commanding the s. s. "Orinoco," reported barometer 29.37 (746.0) at 1 a. m. of the 14th, in N. 36° 30', W. 69° 5'; the gale began with sw. wind, heavy rain and lightning on the afternoon of the 13th, and shifted suddenly to nw. on the morning of the 14th. Vessels to the northward of 40° N. and near the coasts of New England and Nova Scotia had n. and ne. gales, while those to the eastward of W. 58° had s. and ese. winds and rainy weather. During the day the depression was apparently forced to the northwestward by an area of high barometer which was spreading westward over the ocean, and during the 15th the disturbance disappeared in Newfoundland.

8.—From the 16th to the 18th the reports showed unsettled atmospheric conditions existing between Bermuda and the coast of the United States, the barometer being unsteady and relatively low, while strong n., ne., nw., and s. winds to gales prevailed over that region. On the 18th Captain J. R. Beers, commanding the s. s. "Advance," reported: "10 p. m. of the 18th, in N. 34° 0', W. 71° 10', barometer 29.5 (749.3); at 8 a. m. it was blowing a moderate sw. gale, hauling during the day around by w. until 10 p. m., when it reached a force of 9, and was accompanied by heavy thunder and lightning; at midnight the wind was n." The schooner "L. F. Munson," J. H. Smith commanding, in N. 33° 16', W. 74° 57', had barometer 29.68 (753.9), wind nw. by w., force 5; the ship "Ringleader," J. C. Entwistle commanding, in N. 33° 25', W. 74° 0', had barometer 29.75 (755.6), wind n., force 7, squally. The disturbance moved north-northeastward, and on the 19th its centre was near N. 42°, W. 62°, where the pressure was 29.0 (736.6); strong nw. gales, accompanied by rain, sleet, and snow now prevailed between W. 65° and the coast-line from Cape Hatteras northward, and continued during the 20th. The following are the lowest pressures reported on the 19th: s. s. "Lessing," B. Voss, commander, in N. 41° 0', W. 65° 20', 8 a. m., barometer 29.05 (737.9), wind ene., shifting to se., sse., sw., and w., and blowing a strong gale; s. s. "Ems," C. Leist, commander, in N. 41° 15', W. 61° 50', 11.20 a. m., barometer 29.06 (738.1), wind se. to s. and w., whole gale; s. s. "Denmark," Captain Jeffrey, commander, in N. 41° 4', W. 59° 50', barometer 29.06 (738.1), at 11 a. m., gale from sse., veering suddenly to w.; s. s. "Adriatic," H. Parsell, commander, in N. 41° 57', W. 57° 32', barometer 29.19 (741.4), s. gale of force 9, veering to w. During the 19th the depression passed northward over Nova Scotia as a severe storm and entered the Gulf of Saint Lawrence on the 20th, after which it passed beyond the range of observations.

9.—This was probably subsidiary to number 8 above-described. After the passage of that disturbance there was a slight increase of pressure but no abatement in the force of the wind. On the 20th the barometer again fell; Captain Garvin, commanding the s. s. "Orinoco," in N. 38° 00', W. 71° 00', reporting, barometer 29.33 (745.0), at 10 a. m. of the 20th, fresh gale from nw.; at the same time strong winds to moderate gales from e. and se. prevailed over the region to the eastward of

W. 65°. On the 21st the depression, having moved northeastward over the Banks, was apparently central off the southeastern coast of Newfoundland; the w. and nw. gales still continued in the Gulf Stream and the winds had shifted to w. and nw. over the ocean as far as W. 55°, while those to the eastward of that meridian blew with the force of a moderate gale from s., with barometer readings ranging from 29.6 (751.8) to 29.7 (754.4). The barometer rose during the 21st and by the following day the depression had apparently filled in.

10.—This was a continuation of the depression described as low area vi. under "Areas of low barometer" in this REVIEW. By the morning of the 23d this disturbance having passed as a somewhat severe storm northeastward along the Gulf Stream, was central to the southeastward of Nova Scotia with the lowest reported pressure 29.3 (744.2), and attended by moderate to strong gales in all quadrants. An area of high pressure occupied the ocean east of W. 50° and south of N. 45°, along the northwestern edge of which, this depression appears to have passed, with gradually increasing pressure, and by the 24th it was shown near N. 48° W. 45°, where the barometer read about 29.7 (754.4). Strong s. winds prevailed over the region east of 45° W. with n. and nw. winds to the westward. By the 25th the depression had moved northeastward beyond N. 50° and near W. 35°, being attended by moderate sw. gales over the region between N. 50° and 45° and W. 40° and 30°, while nw. and w. winds prevailed over the ocean from W. 40° to the American coast.

The reports indicate the existence of a slight depression which was attended by moderate gales, between W. 60° and the American coast during the 28th and 29th; by the 30th, however, it had disappeared, as the high area from the ocean began to spread westward, and on the 31st it had reached the coast line, the pressure over the ocean west of the sixtieth meridian ranging from 30.4 (772.1) to 30.65 (778.5).

OCEAN ICE.

On chart i. are also exhibited the eastern and southern limits of the region within which icebergs have been observed during March, 1885. These limits are determined from reports furnished by shipmasters, and from trustworthy data published in the "New York Maritime Register," and other newspapers.

During this month the easternmost icebergs were reported in about W. 43° and between N. 44° and 46°; from that point the outer edge of the ice-region extended southwestward, its extreme southern limit being in N. 40° 50', W. 49°, and thence northwestward to about N. 44° 30', W. 62° 0'. Field-ice was observed between N. 46°, W. 47° and N. 44°, W. 49°, and also between N. 44° 30', W. 57° 0' and N. 44°, W. 62'.

Compared with the chart for the preceding month (February 1885) it will be seen that the eastern limit of the ice-region is about one degree west of that for February, while the southern limit has advanced southward about one degree. No reports have been received which indicate the presence of ice to the westward of the sixty-third meridian. Icebergs and field-ice were neither so large nor so numerous as in the preceding month.

The following table shows the comparison between March, 1885, and the same month of the three preceding years:

Southern limit.			Eastern limit.		
Date.	Lat. N.	Lon. W.	Date.	Lat. N.	Lon. W.
March, 1882.....	42 30	50 00	March, 1882.....	46 30	46 00
March, 1883.....	41 46	49 48	March, 1883.....	48 41	43 03
March, 1884.....	41 20	54 06	March, 1884.....	45 00	40 15
March, 1885.....	40 55	49 04	March, 1885.....	45 57	43 15

Icebergs and field-ice were reported as follows:

March 1st.—S. S. "Hanoverian," in N. 42° 50', W. 50° 0', passed several icebergs and some field-ice; kept away fifteen miles to the southward to clear the ice; in N. 42° 35', W. 51° 19', one iceberg and several detached pieces of ice were passed.

S. S. "Canada," in N. 44° 56' W. 48° 43', from 2.30 to 6.30 a. m., encountered field-ice. S. S. "Dago," reported 1 a. m., encountered field-ice; at noon in N. 45° 19', W. 48° 23', was surrounded by thick ice; midnight, still surrounded by field-ice; at 2.30 a. m. of the 2d, cleared field-ice. The s. s. "Scythia," in N. 42° 34', W. 49° 0', passed an iceberg. The s. s. "Moravia," in N. 41° 40', W. 48° 40', at 8 a. m. passed an iceberg about one hundred feet long and fifty feet high, and several smaller pieces of ice about one mile to the northward; temperature of water, 47° Fahr.; air, 56° Fahr.

2d.—S. S. "Roman," in N. 43° 16', W. 49° 5', passed numerous icebergs and large ice-fields as far as the eye could reach; temperature of sea water, 28° Fahr. The s. s. "City of Montreal," in N. 41° 56', W. 52° 27', at 8.35 p. m. passed a large iceberg; also at 8.52 a. m. in N. 42° 16', W. 49° 0', passed another. The s. s. "Ontario," in N. 42° 17', W. 51° 24', passed seven large icebergs. The s. s. "Bohemia," in N. 42° 2', W. 47° 56', passed an iceberg about two hundred feet high.

3d.—S. S. "Donau," between N. 42° 55', W. 49° 24', and N. 42° 34', W. 52° 13', passed three icebergs ranging from sixty to one hundred feet high; the s. s. "State of Indiana," in N. 41° 28', W. 48° 27', at 9 p. m., passed an iceberg.

4th.—S. S. "City of Richmond," in N. 42° 30', W. 48° 30' at 3 a. m. passed an iceberg, water 36°, air 38°; at 2.30 p. m. in N. 42° 33', W. 51° 22', passed another, water 34°, air 38°. The s. s. "Elbe," in N. 42° 33', W. 47° 59', at 3.30 p. m. passed several icebergs of different dimensions. The s. s. "Amaryllis," at 2 p. m. in N. 40° 55', W. 49° 4' passed an iceberg; s. s. "Waesland," at 8.30 a. m. passed an iceberg; s. s. "De Ruyter," in N. 46° 44', W. 44° 14', passed an iceberg; s. s. "Celtic," at 11 p. m. in N. 42° 44', W. 48° 15', passed one large and two small icebergs.

5th.—S. S. "Oregon," in N. 42° 35', W. 48° 30', passed two pieces of ice; s. s. "Wieland," in N. 43° 17', W. 47° 29', passed an iceberg, and during the afternoon passed several others north and south of ship's course. The s. s. "Holland," between N. 42° 47', W. 49° 53' and N. 42° 30', W. 51° 14', passed several icebergs and large pieces of ice; s. s. "Celtic" in N. 41° 54', W. 51° 58', passed two icebergs to the northward and one to the southward. The s. s. "De Ruyter" in N. 45° 44', W. 48° 58' reported at 9 a. m. passed between four large icebergs; at noon entered field ice, being mostly two feet in thickness; at 6 p. m. passed another large iceberg; at 9 p. m. came to open water; at midnight met field-ice again, but very thin; at 3.30 a. m. of the 6th, reached open water again.

6th.—S. S. "Istrian" in N. 43° 0', W. 49° 0', at 8 a. m. passed several icebergs, also passed a very large berg at 9 p. m. in N. 42° 37', W. 52° 0'. The s. s. "Carthaginian" in N. 42° 3', W. 53° 0', passed three large icebergs; s. s. "De Ruyter," in N. 45° 12', W. 53° 31', at noon passed an iceberg.

7th.—S. S. "Sidonian," in N. 41° 53', W. 52° 28', passed an iceberg about three hundred feet high, and some small ice; s. s. "Circassia," in N. 42° 42', W. 48° 35', passed a large iceberg; s. s. "State of Georgia," in N. 42° 53', W. 48° 33', at 10.30 a. m. passed a small iceberg; s. s. "Labrador," in N. 42° 30', W. 48° 15', at 3 a. m., passed an iceberg. The s. s. "De Ruyter," in N. 44° 45' W. 57° 28' at noon, entered field-ice at 4 p. m.; at 8 p. m., field-ice becoming thicker, obliged to reduce speed to dead-slow; cleared field-ice at 6 a. m. of the 8th, position at noon of the 8th, N. 44° 41', W. 61° 20'.

8th.—S. S. "Somerset" saw an iceberg and some field-ice on the eastern edge of the Banks; the ship "Asia," in N. 43° 0', W. 48° 0', passed a large iceberg; s. s. "Iowa," in N. 41° 38', W. 52° 25', passed an iceberg.

9th.—S. S. "Otranto," in N. 44° 20', W. 49° 10', passed a large iceberg; s. s. "Somerset," in N. 43° 14', W. 51° 31', passed three icebergs; ship "Trojan," in N. 43° 0', W. 52° 0', passed three icebergs; s. s. "City of Berlin," in N. 41° 17', W. 52° 20', passed an iceberg.

10th.—S. S. "Richmond Hill," in N. 42° 1', W. 52° 17', passed an iceberg, one hour later passed five others; Captain

Hyde reports: "whilst in the vicinity of ice I noted a rapid change in the temperature of the sea; in N. 41° 53', W. 53° 18', water temperature 33°; in N. 41° 56', W. 53° 42', water temperature 52°." The s. s. "Republic," in N. 41° 48', W. 52° 40', at 10 a. m., passed two icebergs about nine miles to the northward of the ship; the s. s. "Rhein," in N. 42° 6', W. 52° 24', at 8.20 a. m., passed a large iceberg; ship "Lizzie Ross," in N. 43° 2', W. 46° 0', passed a large iceberg; ship "Minnie G. Whitney," in N. 43° 25', W. 51° 23', passed three icebergs.

11th.—S. S. "Fulda," in N. 42° 13', W. 51° 19', passed a large iceberg and some pieces of drift ice; bark "Montreal," in N. 43° 10', W. 50° 10', passed three large icebergs; s. s. "Katie," in N. 42° 10', W. 50° 15', passed an iceberg twenty feet high. The s. s. "Stockholm City," in N. 43° 12', W. 50° 20', at noon passed four small icebergs; 3 p. m., passed two very large bergs, one of which appeared to be aground.

12th.—S. S. "Katie," in N. 42° 4', W. 52° 5', passed four icebergs from seventy to eighty feet high; s. s. "Normandie," in N. 43° 54', W. 47° 15', at 4.30 p. m. passed a small iceberg; s. s. "Polynesian," in N. 42° 56', W. 50° 38', passed an iceberg; bark "Charles Luling," in N. 43° 19', W. 48° 14', passed a large iceberg; s. s. "Grecian," in N. 44° 1', W. 43° 30', at 1.50 p. m. passed a large iceberg, temperature of water, 60°; air, 42°.

13th.—S. S. "Gallia," in N. 42° 33', W. 51° 30', at 10 p. m., passed an iceberg; ship "Lansdowne," in N. 42° 47', W. 53° 0', passed a large iceberg; bark "Charles Luling," in N. 42° 2', W. 51° 15', passed three icebergs; s. s. "Australia," in N. 42° 6', W. 53° 8', at 4 p. m., passed a small iceberg.

14th.—Ship "Shakespeare," in N. 43° 0', W. 49° 0', passed three icebergs; ship "Mary Fraser," in N. 44° 36', W. 43° 41', passed a large iceberg; ship "Rhine," in N. 43° 0', W. 50° 0', passed six large icebergs; bark "Saint Bernhard," in N. 41° 15', W. 50° 10', passed a large iceberg.

15th.—S. S. "Helvetia," in N. 41° 55', W. 49° 23', passed an iceberg; bark "Astronom," in N. 42° 10', W. 49° 40', passed a large iceberg.

16th.—S. S. "Cydonia," in N. 46° 0', W. 47° 0', passed through a quantity of field ice.

17th.—S. S. "Cydonia," in N. 45° 0', W. 49° 20', passed a large iceberg.

18th.—S. S. "Ems," in N. 41° 34', W. 53° 35', passed two large pieces of ice, in N. 41° 33', W. 53° 45', passed a small iceberg; bark "Johanne Marie," in N. 45° 57', W. 43° 15', passed two icebergs.

20th.—Bark "Johanne Marie," in N. 44° 30', W. 49° 8', passed a large iceberg.

21st.—S. S. "Ethiopia" in N. 43° 25', W. 49° 17', passed two icebergs.

22d.—S. S. "Ontario," in N. 43° 1', W. 47° 40', passed a large iceberg; s. s. "Siberian," in N. 42° 40', W. 51° 38', at 4.26 p. m., passed an iceberg bearing s. ten miles distant; at 6.59 p. m., in N. 42° 45', W. 52° 10', passed two smaller bergs with several pieces of drift ice between and around the bergs; temperature of air, 41°; sea, 36°. The s. s. "Venetian," in N. 42° 2', W. 51° 10', passed a small berg; in N. 43° 2', W. 52° 50', passed a medium-sized iceberg.

23d.—S. S. "Ontario," in N. 42° 46', W. 52° 33', passed an iceberg; bark "Nova Scotia," in N. 43° 0', W. 50° 0', passed two large icebergs.

25th.—S. S. "Britannic," in N. 44° 7', W. 48° 50', passed a large iceberg; in N. 44° 7', W. 49° 5', passed a small iceberg; s. s. "Elysia," in N. 43° 50', W. 49° 40', at 5.30 a. m., passed a small iceberg; schooner "J. A. Chapman," in N. 43° 0', W. 54° 30', passed a large iceberg; schooner "G. L. Smith," in N. 43° 40', W. 51° 50' passed several icebergs two of which were very large.

26th.—S. S. "Britannic," in N. 42° 48', W. 54° 2', passed a small iceberg; s. s. "Devon," in N. 46° 30', W. 47° 10', at 7 a. m., passed six icebergs, also fifty miles wsw. of that position passed another.

27th.—S. S. "Aurania," in N. 42° 52', W. 50° 28', at 2 p. m., passed several icebergs to n. and s. of ship's course; bark

"Chignecto," in N. 42° 30', W. 50° 15', passed a large iceberg. 28th—S. S. "Caspian," in 43° 00', W. 50° 00', passed two icebergs.

31st.—S. S. "City of Rome," in N. 43° 14', W. 49° 35', passed an iceberg; s. s. "Norwegian" sighted several icebergs between Cape Pine and Saint John's harbor.

SIGNAL SERVICE AGENCIES.

Signal Service agencies have been established in the Maritime Exchange buildings at New York and Philadelphia, and in the Custom House, Boston, where the necessary blanks and other information will be furnished to shipmasters. In January REVIEW was published an explanation of the object of these agencies.

In pursuance of the arrangements made with the Meteorological Office of London, England, there were, during March, 1885, twelve reports cabled to that office from New York, concerning storm and icebergs encountered by vessels in the Atlantic west of the forty-fifth meridian. Four messages were sent from Boston.

TEMPERATURE OF THE AIR.

[Expressed in degrees, Fahrenheit.]

The distribution of mean temperature over the United States and Canada for March, 1885, is exhibited on chart ii. by the dotted isothermal lines; and in the table of miscellaneous data are given the means for the various stations of the Signal Service.

In the following table are given the mean temperatures for the several geographical districts with the normals and departures, as deduced from the Signal Service observations:

Average temperatures for March, 1885.

Districts.	Average for Mar. Signal-Service observations.		Comparison of Mar., 1885, with the average for several years.
	For several years.	For 1885.	
	°	°	°
New England.....	33.6	26.8	- 6.8
Middle Atlantic states.....	41.0	33.6	- 7.4
South Atlantic states.....	54.6	48.4	- 6.2
Florida peninsula.....	67.0	62.4	- 4.6
Eastern Gulf states.....	58.2	52.2	- 6.0
Western Gulf states.....	59.9	55.7	- 4.2
Rio Grande valley.....	70.0	66.4	- 3.6
Tennessee.....	50.3	41.4	- 8.9
Ohio valley.....	42.2	34.3	- 7.9
Lower lake region.....	33.5	23.0	- 10.5
Upper lake region.....	20.5	17.0	- 3.5
Extreme northwest.....	20.3	21.9	+ 1.6
Upper Mississippi valley.....	36.8	34.3	- 2.5
Missouri valley.....	37.8	34.4	- 3.4
Northern slope.....	32.0	35.1	+ 3.1
Middle slope.....	40.8	40.4	- 0.4
Southern slope.....	55.8	51.5	- 4.3
Southern plateau.....	52.0	54.0	+ 2.0
Middle plateau.....	40.4	45.0	+ 4.6
Northern plateau.....	49.9	47.0	- 2.9
North Pacific coast region.....	46.0	49.9	+ 3.9
Middle Pacific coast region.....	54.0	55.9	+ 1.9
South Pacific coast region.....	58.5	62.6	+ 4.1
Mount Washington, N. H.....	11.1	2.1	- 9.0
Pike's Peak, Colo.....	7.8	9.3	+ 1.5

In the extreme northwest, upper Missouri valley, Rocky mountain region, and on the Pacific coast, the mean temperatures for March, 1885, were above the normal, while in all districts to the eastward they were below the normal. The greatest departures below the normal occurred in the lake region and Ohio valley, where, at numerous stations, the departures exceeded 10°. In the Gulf states and in the districts along the Atlantic coast, the departures, though less marked, were decidedly below the normal. In the districts where the month has been warmer than the average the departures above the normal temperature have been greatest in the northern slope and northern plateau, where they averaged 6°.1; in the middle plateau and on the Pacific coast the departures averaged about 4°.

RANGES OF TEMPERATURE.

The monthly and daily ranges of temperature at the various Signal Service stations are given in the table of miscellaneous

meteorological data. They varied from 24° at Key West, Florida, and 24°.5 at Tatoosh Island, Washington Territory, to 73° at Escanaba, Michigan, and 76° on the summit of Mount Washington, New Hampshire. In all districts east of the Rocky mountains, except along the Gulf coast and on the Atlantic coast south of Massachusetts, the monthly ranges of temperature exceeded 50°.

DEVIATIONS FROM MEAN TEMPERATURE.

The departures exhibited by the reports from the regular Signal Service stations are shown in the table of average temperatures for the various districts, also in the table of miscellaneous data and on chart iv. The following notes in connection with this subject are reported by voluntary observers:

Arkansas.—Lead Hill, Boone county: mean temperature, 45°.5, is 4°.4 below the March average for the three preceding years.

California.—Hydesville, Humboldt county: mean temperature, 51°.7, is above the average for March; it is 3°.2 above that for March, 1884.

Connecticut.—Hartford: mean temperature, 26°.7, is 7°.7 below that for March, 1884.

Norfolk. mean temperature, 19°.7, is the lowest recorded in March during the last forty years.

Dakota.—Webster, Day county: mean temperature, 27°.6, is 5°.4 above the March average for the two preceding years.

Georgia.—Milledgeville: the month was the coldest March for many years; the mean temperature, 49°.8, is 7°.4 below that for March, 1884.

Illinois.—Mattoon, Coles county: mean temperature, 34°.5, is 3°.7 below the March average for the last five years.

Anna, Union county: mean temperature, 40°.7, is 5°.7 below the March average for the last ten years.

Swanwick, Perry county: mean temperature, 38°.2, is 5°.4 below the March average for the last three years.

Riley, McHenry county: mean temperature, 24°.8, is 5°.3 below the March average for the last twenty-four years. The mean temperature for the first twenty-three days was lower than for any corresponding period previously recorded.

Peoria, Peoria county: mean temperature, 31°.1, is 4°.6 below the March average for the last thirty years.

Sycamore, Dekalb county: mean temperature, 25°.7, is 6°.8 below the March average for the three preceding years.

Indiana.—Logansport, Cass county: mean temperature, 29°.6, is 10°.7 below the March average for a period of twenty-six years.

Vevay, Switzerland county: mean temperature, 35°.7, is 7°.1 below the March average for the last twenty-one years. The minimum temperature on the 23d, 8°, is the lowest that has occurred at so late a date during the above period.

Spiceland, Henry county: mean temperature, 30°.1, is 6°.3 below the March average for a period of thirty years.

Kansas.—Independence, Montgomery county: mean temperature, 43°.1, is 2° below the March average for the last fourteen years.

Wellington, Sumner county: mean temperature, 41°.6, is 1°.6 below the March average for the last seven years.

Lawrence, Douglas county: mean temperature, 40°.6, is 1°.2 below the March average for the last seventeen years.

Yates Centre, Woodson county: mean temperature, 40°.4, is slightly below the March average for the last five years.

Maine.—Gardiner, Kennebec county: mean temperature, 20°.8, is 8°.7 below the March average for the last forty-nine years, and is the lowest recorded during that period, the next lowest being 22°.0 for March, 1872.

Maryland.—Fallston, Harford county: mean temperature, 30°.6, is the lowest recorded in March during the last fourteen years, and is 8°.1 below the average for the same period; it is but a small fraction of a degree above the mean temperature for January for a period of fifteen years.

Massachusetts.—Somerset, Bristol county: mean temperature, 28°.2, is 6°.2 below the March average.